Supplementary Information

Ionic Liquid-Mediated ZnO Shape-Controlled Nanocrystal-Supported Au Catalysts: Highly Stable Materials for aldehyde Oxidative esterification

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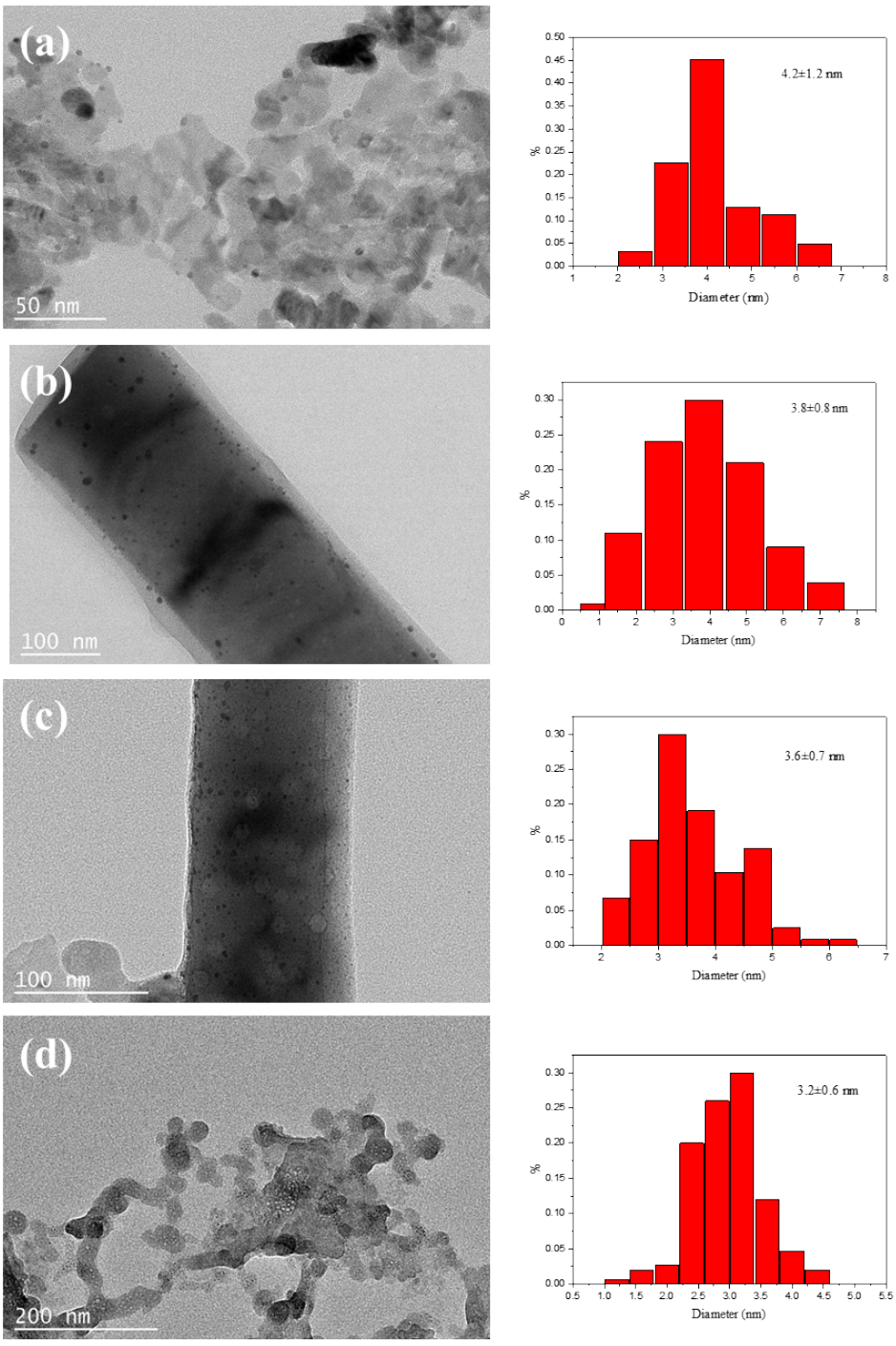

Fig. S1. The TEM images of catalysts and relevant Au particles size distribution: (a) Au/ZnO-C6; (b) Au/ZnO-C10; (c) Au/ZnO-C14; (d) Au/ZnO-CTAB.

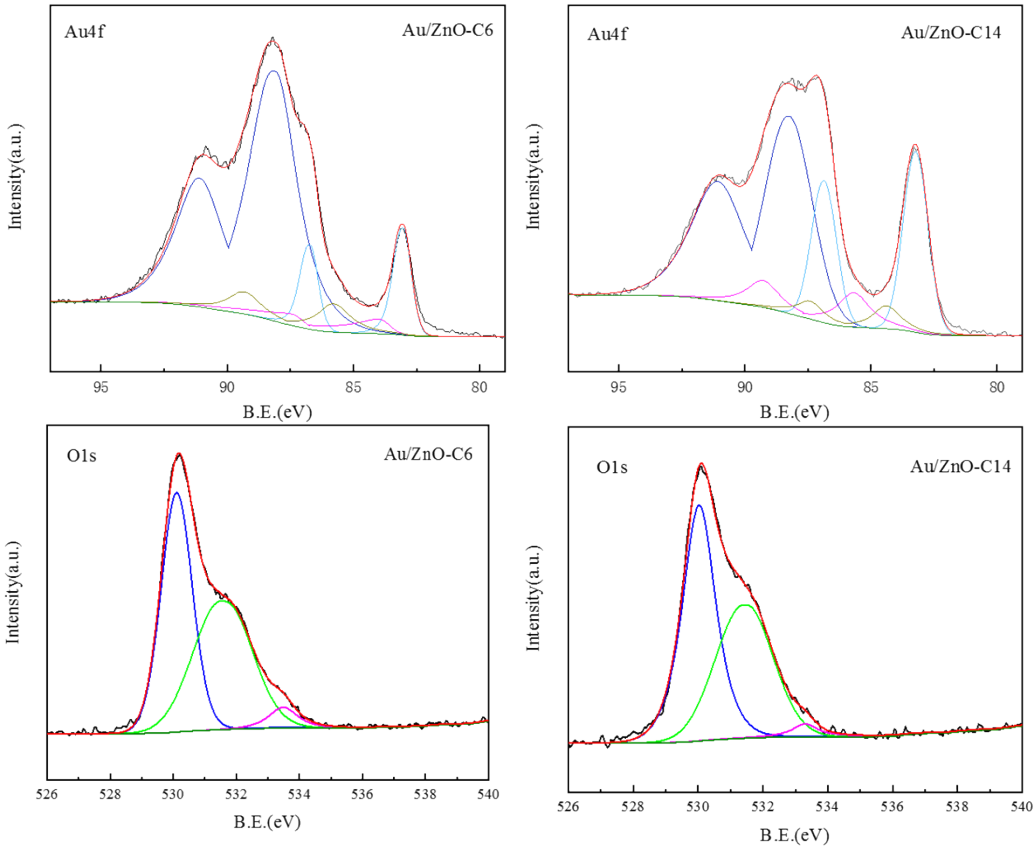

Fig. S2. XPS spectra of Au/ZnO-C6 and Au/ZnO-C14

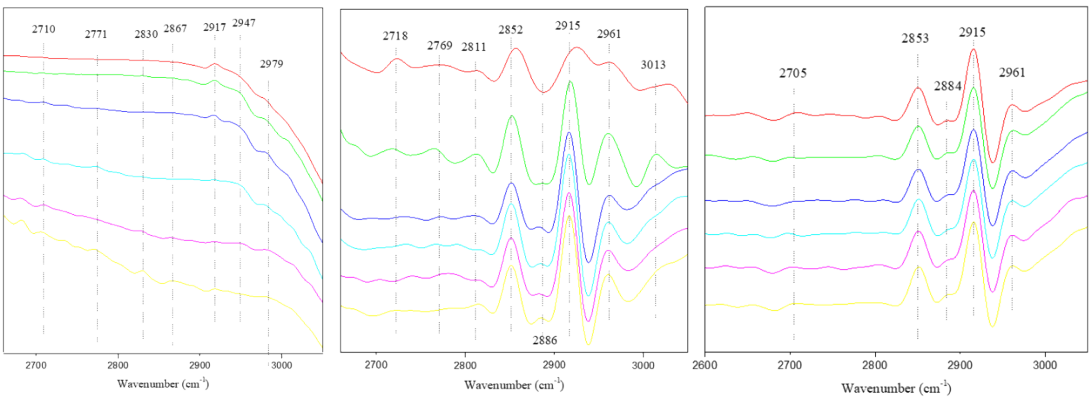

Fig. S3. In-situ FT-IR spectra of MAL and MeOH in presence of O_2 at different temperatures over time on Au/ZnO-C10 in the region of 2700-3100 cm^{-1}: (a) 40 ^oC; (b) 60 ^oC; (c) 80 ^oC.

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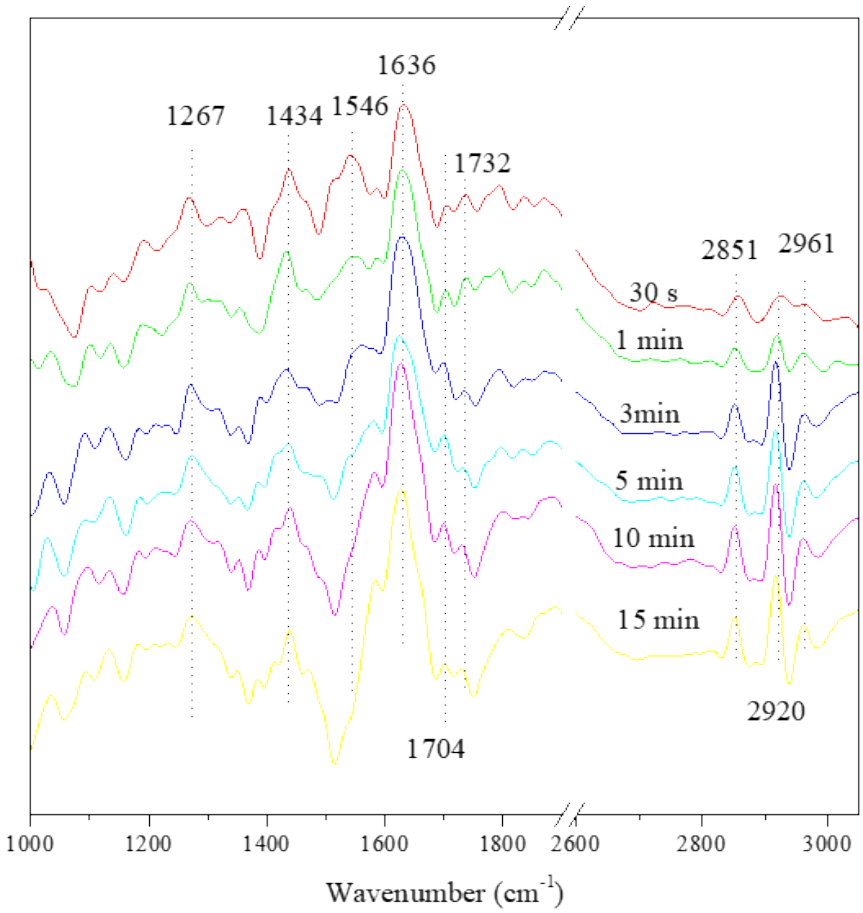

Fig. S4. In-situ FT-IR spectra of MAL and MeOH in absence of O_2 at different temperatures at 10 min on Au/ZnO-C10

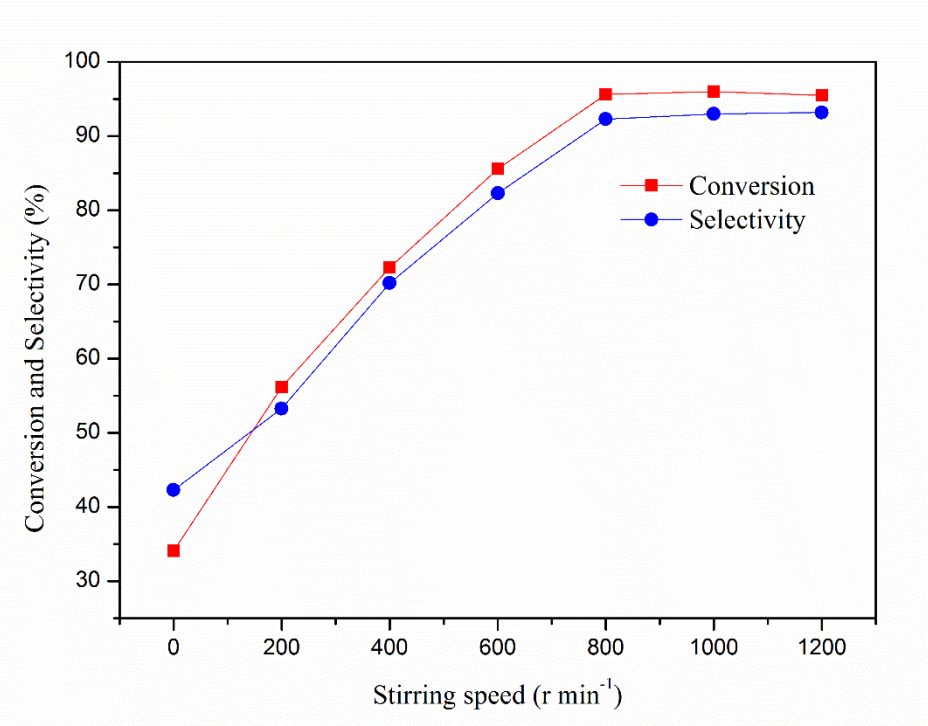

Fig. S5. The effect of stirring speed

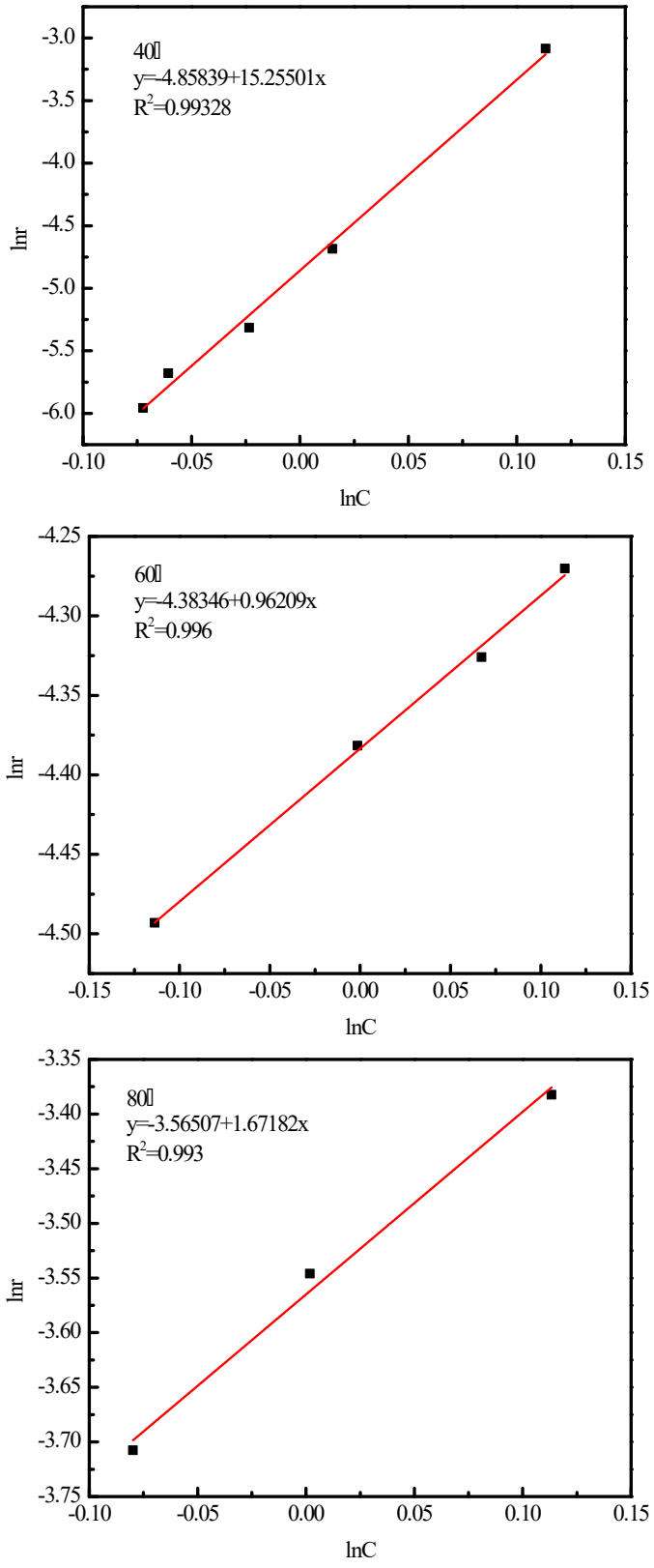

Fig. S6. Fitting curves between ln *r* and ln(*CMAL*) at 313 K, 333 K and 353 K when the conversion is < 15%.

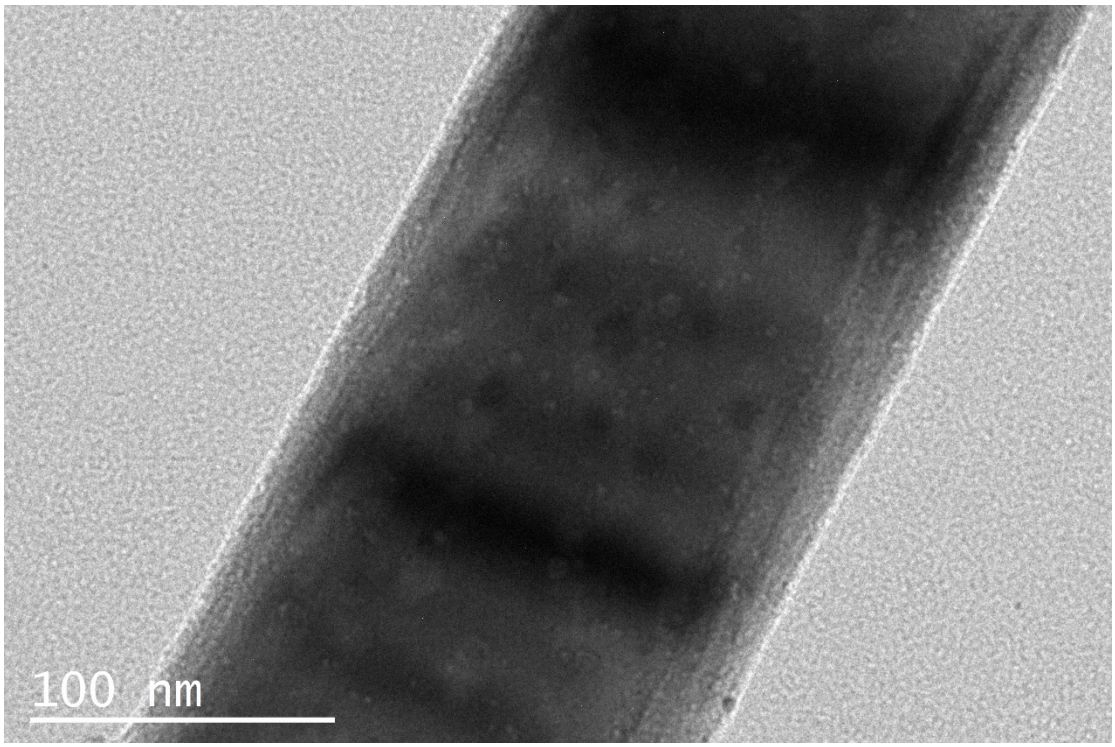

Fig. S7. TEM image of Au/ZnO-C10 after reaction

Table S1 XPS analysis for Au/ZnO catalysts

Catalyst	O_I		O_{II}		O_{III}	
	BE(eV)	%	BE(eV)	%	BE(eV)	%
Au/ZnO-C6	**530.11**	**48.72**	**531.51**	**47.03**	**533.48**	**4.25**
Au/ZnO-C10	**529.99**	**45.43**	**530.68**	**38.01**	**531.72**	**16.56**
Au/ZnO-C14	**530.03**	**51.64**	**531.40**	**45.09**	**533.29**	**3.27**
Au/ZnO-CTAB	**529.92**	**53.71**	**531.35**	**42.42**	**533.08**	**3.87**